

REMARKS

The presently claimed invention is a polymer electrolyte fuel cell. The claimed fuel cell is able to reduce the generation of radicals through control of the electrode potential of an internal electrode by a voltage application device. See paragraph [0028] of the PG publication corresponding to the present application (i.e., US 20040247955). The method of Claim 7 controls the movement of fuel or oxidizer permeated in the ion exchange membrane by applying a voltage. By applying an “as high as possible” voltage to the internal electrode, hydrogen can be oxidized and the movement of hydrogen towards a reducing electrode can be minimized. See paragraph [0028] of the US 20040247955.

Applicants submit that the prior art relied on by the Office does not disclose or suggest the presently claimed polymer electrolyte fuel cell. For example, JP58-176879 (JP '879) discloses a fuel cell made of, e.g., polymolybdates and polytungstates such as $H_3Mo_{12}PO_{40}\cdot29H_2O$ and $H_3W_{12}PO_{40}\cdot29H_2O$ (see pages 355 and 356 of JP '879). Moreover, the English abstract of JP '879 discloses that the prior art disclosure is drawn to a “solid-state electrolytic fuel cell”, not a polymer electrolyte fuel cell as presently claimed.

Although the Office asserts that JP '879 discloses an internal electrode, the third electrode of JP '879 is a probe to monitor voltage differences. For example:

According to this fuel cell, not only voltage of the cell as a whole can be measured but also the voltage between the fuel cell electrode and the third electrode 3 as well as the voltage between the oxidizer electrode 7 and the third electrode can be discriminated and measured simultaneously and thereby a wide variety of polarization can be separately evaluated.

The third electrode of JP '879 can not apply a voltage and thus it cannot carry out the function of the internal electrode of the present claims.

With regard to US 6,756,141 (i.e., US '141), Applicants note that the third electrode of US '141 (identified as reference numeral 104) is likewise a reference electrode. The US

‘141 third electrode is used to measure AC impedance. See the figures of the US ‘141 patent.

The third electrode is also described as follows:

The third electrode may be used to control processes of the anode and/or the cathode electrodes. The third electrode may also be used to monitor the health of any component of the fuel cell.

See the abstract of US ‘141.

While the third electrode of the US ‘141 patent may be used to control the other electrodes, this control is by feedback measurements, not by applying a voltage. The US ‘141 patent does not disclose or suggest that the third electrode may oxidize fuel or reduce an oxidizer, or for that matter, control the movement of hydrogen atoms through an electrolyte.

Applicants thus submit that the presently claimed polymer electrolyte fuel cell having an internal electrode and a voltage application device is different from the solid-state electrolyte fuel cell of JP ‘879 and the three electrode fuel cell of US ‘141.

For the reasons discussed above, Applicants submit that present independent Claims 1 and 7 are novel and not obvious in view of the prior art of record and respectfully request allowance of all now-pending claims.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

SPW:SUK\rl

Stefan Koschmieder
Steven P. Weihrouch
Attorney of Record
Registration No. 32,829

Stefan U. Koschmieder, Ph.D.
Registration No. 50,238